CONSTRUCT THE KC-135 SIMULATOR

Summary

This device works in exactly the same way as the airplane (KC 135) NASA uses to create a brief microgravity environment. By throwing the KC 135 simulator in a high parabolic path, any objects within will temporarily be suspended in microgravity - which will be caught on camera, then replayed on slow motion video to demonstrate the physics at work.

Materials

NOTE: Many types of cameras will suffice and may be cheaper.
Snap-Ware Clear Canister (4.5" diameter, 11"long, made by FloToolInternationa, $10)
Medium Density Foam (2 to 3" thick)
Camera (Cop Security 12V wireless, model 15-2400CTSL, $250)
Receiver (Cop Security model 152400VRP-90092703, $100)
Nicad Rechargeable Battery Pack, $20
Velcro hook and latch connector tape
TV
VCR with slowmotion, 1/2 inch video cassette

$300 to $400 Estimated Cost
Not including TV, VCR, or Video Cassettes

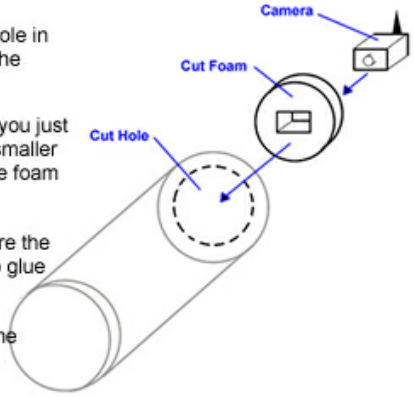
Step 1 Cut a circular hole in the bottom of the clear plastic cylinder.

Step 2 Cut a piece of medium density foam to fit in the circular hole in the bottom of the cylinder. It's a good idea to double up the foam so it is 3 or 4 inches thick for extra padding.

Step 3 Cut a small square hole in the center of the disk of foam you just made. The camera will slide in here. Make this square smaller than the actual camera so you can ensure a snug fit. The foam will protect the camera during use.

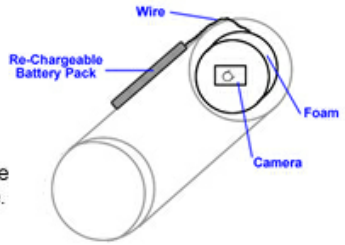
Step 4 Slide the camera into the square hole in the foam. Be sure the antenna on the back of the camera remains exposed - no glue or tape is needed.

Step 5 Slide the foam disk and camera into the circular hole in the bottom of the cylinder - no glue or tape is needed.

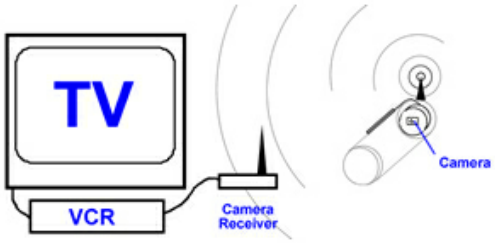


Step 6 Attach the rechargeable battery pack to the side of the cylinder with Velcro, and then connect it to the camera via the wire. In some cases you may need an adapter to connect the camera to the battery pack, depending on your equipment.

Step 7 Attach the receiver to the VCR and activate the camera, reciever and TV/VCR. Test the clarity of the picture. Be aware that electromagnetic interference may cause an uclear picture. Change locations of you have trouble.



Step 8 Finally, put some objects inside and practice throwing it - either between partners or up and down to yourself. It works best NOT to throw it like a football, but underhanded instead.



USE OF THE KC-135 SIMULATOR

Summary

This device works in exactly the same way as the airplane (KC 135) NASA uses to create a brief microgravity environment. By throwing the KC 135 simulator in a high parabolic path, any objects within will temporarily be suspended in microgravity - which will be caught on camera, then replayed on slow motion video to demonstrate the physics at work.

NOTES

An option: Print out the full color poster of the KC 135, mount it and place it on an easel on stage. Attach the KC 135 simulator directly to the poster - on the fuselgae of the airplane. (This can be done with velcro or a cut out section to hold the clear cylinder). Retrieving the device from this poster for the demo will help to complete the conceptual analogy.

Estimated Time
5 to 7 minutes

CLICK HERE FOR POSTER

Step 1 In compliance with the script, select a volunteer from the audience - someone old enough to catch a ball securely.

Step 2 Place objects inside the cylinder - the script calls for Star Wars action figures, including Darth Vader. (any small objects can be used)

Step 3 Turn on the camera inside the cylinder (usually this will involve simply pluggin it in to the battery pack) and the TV/VCR. Be sure the focus is set prior to the performance. Press record on the VCR - be sure a tape is in it.

Step 4 Position the volunteer 10 to 20 feet away from you. Toss the cylinder back and forth 3 or 4 times (it works best to toss it under-handed). Be sure the cylinder travels in a high parabolic path. Explain the concepts involved as you do the demo.

Step 5 Rewind the video tape to the beginning of the session and replay the video in slow motion. You should be able clearly see the effects of freefall on all the objects inside the cylinder - just like the real KC 135.

Step 6 Thank your volunteer with a warm round of applause.